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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

Applicant: Yasutaka SAKAINO et al.

Appl. No. 09/229,628

Filed: January 13, 1999

For: SEMICONDUCTOR
INTEGRATED CIRCUIT

Art Unit: 2814

Examiner: Mr. Phat X. Cao

Atty. Docket No. 32014-141666

Customer No.



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#20 Reply
Brief
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Date: August 12, 2002

Reply Brief

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Examiner's Answer of June 19, 2002, Applicants submit this Reply Brief in accordance with 37 C.F.R. 1.193(b)(1).

In section 10, paragraph 1 of the Examiner's Answer, it is asserted that claims 1-5 and 16-21 are rendered obvious over JP 6-232345 to Ando in view of U.S. Patent Number 5,844,281 to Narita. Applicants respectfully submit that such assertion is based on a misinterpretation of Narita.

Page 4, third full paragraph of the Examiner's Answer states that it would have been obvious to modify the structure of Ando by forming a total number of holes in the first and third contact hole groups to be more than a total number of contact holes in the second and fourth contact hole groups "for the purpose of preventing the breakdown of diffusion layer by limiting the current flowing through the total number of holes in the first and third contact hole groups". Column 5, lines 31-35 of Narita are cited as providing the motivation for such a modification of

Ando. However, column 5, lines 31-35 of Narita makes absolutely no mention of varying the number of contact holes to limit the current flow. In fact, Narita teaches, "the current can be limited by the resistance of the tungsten silicide wiring 11" that is used for connection to the source region, column 5, lines 26-33. Accordingly, Narita makes no mention of the number of contact holes or varying the number of contact holes. Narita discloses limiting the current using the resistance of a tungsten silicide wire. Therefore, there is no motivation to make the modifications proposed by the Examiner.

Instead, in contravention of the law, the motivation for combining these two references is taken directly from Applicants' disclosure, and not from the prior art. "Both the suggestion [to combine] and the reasonable expectation of success must be found in the prior art, not in the Applicant's disclosure." In re Vaeck, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991) (citing In re Dow Chemical Co., 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988) (citations omitted). Here, the motivation to combine the references came impermissibly from the Applicants' disclosure, and not from the prior art. The prior art of Ando and Narita provides no motivation for changing the number of contact holes over a drain region, and further provides no reasonable expectation that such changing the number of contact holes over a drain region would be successful. Hence, the motivation for combining these two references is improper.

In section 11, paragraph A of the Examiner's Answer, the Examiner discounts Applicants' arguments that the combination of Narita with Ando results in no change in the number of first contacts compared to the number of second contacts in the source region. The Examiner believes these arguments are not the type of factual evidence required to rebut a prima facie case of obviousness. However, Applicants are not attempting to rebut a prima facie case of

obviousness. Applicants are arguing that a prima facie case of obviousness has not been established.

In order to establish a prima facie case of obviousness, all claim limitations must be taught or suggested by the prior art. See In re Royka 49 F.2nd 981 (CCPA 1974); MPEP §§ 2142 and 2143.03. Applicants' arguments in the Appeal Brief regarding the arrangement of the first and second contacts in an alternating fashion in Ando and Narita are presented to illustrate that all the claim limitations are not taught or suggested by the prior art and that a prima facie case of obviousness has not been established.

In section 11, paragraph B of the Examiner's Answer, it is asserted that Applicants are individually attacking the references used in an obviousness rejection. Quite the contrary, Applicants have argued throughout the prosecution of this application that the prior art does not teach or suggest the desirability of the modification or combination of the references and, even if the references were combined, such combination does not result in the claimed invention.

"[O]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention", as recognized by the Examiner on page 7, first paragraph of the Examiner's Answer. The modification of Ando in view of Narita does not result in the claimed invention, contrary to the Examiner's assertion. For example, Ando discloses contacts 105, 106 arranged in an alternating order over a source region 103. Narita discloses contacts 71, 72 arranged in an alternating order over source region 51. In Narita, a distance d1 between an N-type diffusion layer 4 and a source 51 of an N-type transistor 101 should be about 100 microns to 300 microns in order to obtain sufficient electrostatic protection, see column 1, lines 33-41 and Figure 1. If the distance d1 between the source diffusion layer 51 and the N-type diffusion layer 4 is less than a critical distance (100 microns), the source

diffusion layer 51 should be connected to a grounding wire 3 via a silicide wire 11, as shown in Figures 1 and 2 of Narita. If the distance $d1$ is higher than the critical distance, the source diffusion layer may be directly connected to the grounding wire 3, column 5, lines 11-20. Accordingly, Narita changes the number of contact holes in the source diffusion layer 51 based upon a distance between the source diffusion layer 51 and the N-type diffusion layer 4. There is no teaching in Ando or Narita of changing the number of contact holes above a drain region of a transistor.

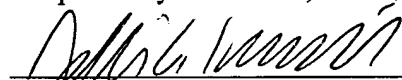
In comparison, the rejected claims require a different number of types of contact holes over both the source region and the drain region. In particular, independent claim 3 recites a semiconductor device having a number of first contacts being different from the number of second contact group formed in a source region and a number of third contacts being different from a number of fourth contacts formed in a drain region. Independent claim 16 recites the number of first contacts being more than twice as large as the number of second contacts and the third number of contacts being more than twice as large as the fourth number of contacts. Accordingly, the claims require a different number of types of contact holes over both the source region and the drain region. Neither of the cited references discloses or suggest using first and second contacts over the drain region. Thus, such a structural feature is not suggested by the prior art and does not result from the Examiner's proposed modification of Ando.

In fact, Narita teaches away from the combination proposed by the Examiner by expressly teaching that there is no need to modify the contact above a drain diffusion layer. Figure 4 of Narita illustrates a semiconductor device. The source diffusion layer 51 of transistor 101 is arranged at a distance $d1$ from the diffusion layer 4. The distance $d1$ from the source diffusion layer 51 to the N-type diffusion layer 4 is less than the critical distance. Therefore, the

grounding wire 3 is connected to the source diffusion layer 51 via the tungsten silicide 11, column 5, lines 50-56. However, drain diffusion layer 81 is also arranged less than the critical distance to the diffusion layer 4, yet no grounding resistance wiring is provided, column 5, lines 58-64. Narita states even when the drain region is less than the critical distance, the construction of the device should be identical to that of Figure 1, column 5, lines 56-61. Accordingly, there is no teaching or suggestion in Narita to modify the drain region of Ando such that there are two types of contacts as is recited in the present claims. Hence, Narita teaches away from the Examiner's proposed combination.

In view of the foregoing, it is submitted that the Examiner's rejection of the claims is in error and should be reversed.

Respectfully submitted,



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